Parro Cheung
Y10Hope

a) $\begin{pmatrix}2&1\\1&2\end{pmatrix}\begin{pmatrix}2&1\\1&2\end{pmatrix}$

$=\begin{pmatrix}5&4\\4&5\end{pmatrix}$

b) $\begin{pmatrix}3&2\\2&3\end{pmatrix}\begin{pmatrix}3&2\\2&3\end{pmatrix}$

$=\begin{pmatrix}13&12\\12&13\end{pmatrix}$

c) $\begin{pmatrix}4&3\\3&4\end{pmatrix}\begin{pmatrix}4&3\\3&4\end{pmatrix}$

$=\begin{pmatrix}25&24\\24&25\end{pmatrix}$

d) $\begin{pmatrix}a+1&a\\a&a+1\end{pmatrix}\begin{pmatrix}a+1&a\\a&a+1\end{pmatrix}$

$\cancel{(a^4+2}$ $\begin{pmatrix}a^4+2&a^4+2\\a^4+2&a^4+2\end{pmatrix}$

e) Yes

f) No, because if the number involve negative number the answer may not be the same.

g) $\begin{pmatrix}2&1\\1&2\end{pmatrix}\begin{pmatrix}3&2\\2&3\end{pmatrix}$

$=\begin{pmatrix}8&7\\7&8\end{pmatrix}$

h) $\begin{pmatrix}3&2\\2&3\end{pmatrix}\begin{pmatrix}4&3\\3&4\end{pmatrix}$

$=\begin{pmatrix}18&17\\17&18\end{pmatrix}$

Pg2

i) $\begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix}\begin{pmatrix} 4 & 3 \\ 3 & 4 \end{pmatrix}$

$= \begin{pmatrix} 11 & 10 \\ 10 & 11 \end{pmatrix}$

J) Messi's hypothesis is right only if the patterns of the number are ordered. Therefore, in this situation Messi's hypothesis is right.

K ~~a~~) $\begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix}\begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix}\begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix}$

$= \begin{pmatrix} 5 & 4 \\ 4 & 5 \end{pmatrix}\begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix}$

$= \begin{pmatrix} 14 & 13 \\ 13 & 14 \end{pmatrix}$

L ~~M~~) $\begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix}\begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix}\begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix}\begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix}$

$= \begin{pmatrix} 5 & 4 \\ 4 & 5 \end{pmatrix}\begin{pmatrix} 5 & 4 \\ 4 & 5 \end{pmatrix}$

$= \begin{pmatrix} 41 & 40 \\ 40 & 41 \end{pmatrix}$

m) $\begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix}\begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix}\begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix}\begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix}\begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix}$

$= \begin{pmatrix} 5 & 4 \\ 4 & 5 \end{pmatrix}\begin{pmatrix} 5 & 4 \\ 4 & 5 \end{pmatrix}\begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix}$

$= \begin{pmatrix} 41 & 40 \\ 40 & 41 \end{pmatrix}\begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix}$

$= \begin{pmatrix} 122 & 121 \\ 121 & 122 \end{pmatrix}$

Parro Cheung
Y10Hope

n) I notice that the number is mutiplied by 3 everytime the squre increases.

$$L^{(n-1)} = \begin{pmatrix} n-1 & n-2 \\ n-2 & n-1 \end{pmatrix}$$

Part 2

Matrix $T = \begin{pmatrix} 2 & 5 & 4 \\ 1 & 1 & 3 \end{pmatrix}$

a) $\cancel{\begin{pmatrix} 2 & 5 & 4 \\ 1 & 1 & 3 \end{pmatrix}\begin{pmatrix} & \\ -1 & 0 \end{pmatrix}}$

$$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}\begin{pmatrix} 2 & 5 & 4 \\ 1 & 1 & 3 \end{pmatrix}$$

$$= \begin{pmatrix} -1 & -1 & -3 \\ -2 & -5 & -4 \end{pmatrix}$$

b) MT represents a transformation. I am finding how $\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$ effects the matrix $\begin{pmatrix} 2 & 5 & 4 \\ 1 & 1 & 3 \end{pmatrix}$.

c) The matrix $\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$ is responsible for the reflection upon x axis and also the enlargement.

d) $$\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}\begin{pmatrix} 2 & 5 & 4 \\ 1 & 1 & 3 \end{pmatrix}$$

$$= \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}\begin{pmatrix} 2 & 5 & 4 \\ 1 & 1 & 3 \end{pmatrix}$$

$$= \begin{matrix} 2 & 5 & 4 \\ 1 & 1 & 3 \end{matrix}$$

d) M^2T did not change the matrix because $\begin{pmatrix}1&0\\0&1\end{pmatrix}$ is an identical number.

e) $\begin{pmatrix}0&-1\\-1&0\end{pmatrix}\begin{pmatrix}0&-1\\-1&0\end{pmatrix}\begin{pmatrix}0&-1\\-1&0\end{pmatrix}$

$=\begin{pmatrix}1&0\\0&1\end{pmatrix}\begin{pmatrix}0&-1\\-1&0\end{pmatrix}$

$=\begin{pmatrix}0&-1\\-1&0\end{pmatrix}$

The answer is $\begin{pmatrix}0&-1\\-1&0\end{pmatrix}$ and it is same as the original number

f) M^{-1}

$=\frac{1}{-1}\begin{pmatrix}0&1\\1&0\end{pmatrix}$

$=-1\begin{pmatrix}0&1\\1&0\end{pmatrix}$

$=\begin{pmatrix}0&-1\\-1&0\end{pmatrix}$

The inverse of $\begin{pmatrix}0&-1\\-1&0\end{pmatrix}$ is also of the answer $\begin{matrix}0&-1\\-1&0\end{matrix}$ after calculating.

g) The first way is to use a calculator which is simple because you only have to insert the number Another way is to use computer which is also easy because all you have to do is insert numbers. I think that using computer is more appropriate because it can store more value of number.

Porco Cheung
Y10Hope.